

## Chapter 7

# Can designers and AI flourish together?

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Artificial intelligence (AI) is a computer's ability to simulate how humans think and act. Ever since its emergence in the 1950s, it has been the subject of intense interest, offering the possibility of disrupting industries across a range of sectors. For instance, generative AI uses algorithms to produce novel data, texts, videos, and images based on patterns and relationships identified in existing data. In design industries, generative AI is used as a design process to write design briefs or create a number of possible design solutions. For instance, Airbus partnered with Autodesk, the design and engineering software company, to design components of planes of the future using generative design in 2015 (Autodesk, 2015). In 2018, Autodesk introduced an interactive visual analysis tool called Dream Lens to help designers explore a large array of 3D design solutions at the Computer–Human Interaction conference. With this system, they were able to create a number of 3D-printed monitor stand design variations (Figure 7.1). Recently, AI has been in transition from these 'brute force' approaches of creating billions of designs to effective approaches of providing optimal design solutions. Superficially, there is the potential for an artificial designer to only bring positive impacts that enable the creation of designs with better efficiency and speed than when the task was given to a human designer. However, design AI is now being faced with a number of new challenges as to what it means to be a designer and for the role of design in future. This provocation highlights some of the critical issues designers will have to consider if they are to flourish alongside AI, which then suggests the potential for critical contributions of design research towards value creation.

In terms of protecting the ownership of AI-inspired design, the key issues of flourishing alongside this technological revolution are copyright and the ownership of work produced by algorithms. In the past year, the most well-known artificial intelligence models to produce content have been released by OpenAI: ChatGPT (a chatbot that mimics human conversation) and DALL-E (a tool for AI-generated art that generates digital images from text descriptions). Generative AI uses existing content to train a machine-learning model to produce new works. The training data for ChatGPT is largely pulled from the internet—from Wikipedia to Reddit, the BBC, blog posts, books, and more. Similarly, DALL-E uses the vast corpus of images found online. Hence, the output generated by AI from copyright-protected data might infringe copyright and could face serious legal challenges. Indeed, a



Figure 7.1

**Conceptual illustration of a collection of design variations for a single task: lifting a computer monitor 80 mm off a desk.**

*Image courtesy: Matejka, J. et al. (2018) 'Dream lens: exploration and visualization of large-scale generative design datasets', Proceedings of the 2018 CHI conference on human factors in computing systems (CHI '18). Association for Computing Machinery, New York, NY, USA, Paper 369, pp. 1–12. <https://doi.org/10.1145/3173574.3173943>. Fig. 1, with permission.*

group of artists have filed a lawsuit against the companies behind AI art generators, Stable Diffusion (Chen, 2023).

Regarding commercial implications, these generative AIs also raise another significant question: 'Who has the ownership of output generated by AI?' This ambiguity can cause great confusion and potentially undesirable consequences. If the works generated by AI are not protected by copyright, the obvious question is, 'Does this mean work created by AI can be freely used and reused by anyone around the world?' which is not very hopeful for the company that invested in the design. To address this, OpenAI has attempted to transmit its ownership of the generated content as part of the product's terms of use if the outputs are original. However, 'original' is somewhat unclear, as it is unlikely that you would know whether the AIs have ever generated the same outputs before. Moreover, it is likely to be ineffective in Spain, Korea, Australia, and the US, where only work produced by human beings can be granted copyright protection. On the other hand, if the designer contributes to AI-generated work with some level of intervention, 'What level of copyright can the designer have?' Clearly, we are at a transitional stage of rapid AI development and implementation in which notions of originality are understood differently.

Apart from the problematic questions surrounding copyright and commercial implications, artificial intelligence may pose an imminent threat to designers' livelihoods, because design is one of the most creative human activities. For instance, in generative design, AI creates thousands of options based on the requirements of structures and substructures. It then identifies and suggests the top few options that best fit the design requirements. AI-generated design solutions can be cost-effective and efficient and result in more manufacturable products. In this process, a designer's contribution is to assess the results and select the most effective, best-performing and aesthetically pleasing design. However, would designers value this role over the existing one that more readily involves their imagination and creative practice? As creative thinkers, problem-finders, -solvers,

and innovators, designers are regarded as highly valuable assets to any business. They make their ideas tangible by sketching, drawing, prototyping, building, and experimenting, which sometimes involves uncomfortable, challenging, and complex processes. While developing designs through these creative activities, designers also find the meaning of what it is to be designers and continuously build on their creative thinking. Although hundreds of novel designs can be generated by AI algorithms, which might be perceived as beneficial to the business, it would diminish what it means to be a designer by using what is, in effect, a 'brute force' approach to replace the skills of designers going through the creative process and essentially turning them into algorithm wranglers.

Despite the concerns that artificial designers may well eventually replace human designers, the author argues that a human designer's ability in problem-finding and -framing is needed more than ever. It is evident that AI would bring several advantages, such as cost-effective businesses and improving the customer experience by analysing users' behaviour patterns in real time. However, when we look at the design process thoroughly, there are distinct advantages that human designers bring. These are the design research activities in the early stages of the process, such as empathising with others, problem-finding and -framing based on a thorough understanding of the context, and making sense of subtle nuances and complexities in decision-making. Humanity has been critically valued through the design process, specifically when tackling a wicked problem. Most likely, a design process begins with comprehending the real-world situation, identifying an opportunity, revealing underlying needs, and understanding the context of a challenge. Empathy for the users is critical at this early stage of the design process, which is not yet embedded in algorithms, and true empathy may prove to be beyond AI development for some time. It may even prove to be a fundamental limitation. Designers learn as much as possible about users' wants, needs, anxieties and difficulties and turn these into an actionable problem statement which identifies the gap between the current situation and the desired one of a process or a product. AI can confirm if the problem statement is accurately framed based on an understanding of the users. However, without a human designer's empathy, the problem statement will only be superficial, missing important details of the challenges.

Designers' ingenuity and value judgements are also qualities in which AI is unable to surpass human designers. The design process is an iterative journey in which we transform disorder into order, generate diverse ideas, and creatively synthesise them to generate pleasing outcomes. While we transform disorder into order, we make numerous difficult decisions, particularly when there is no clear answer due to a conflict of interest or uncertainty, which could have an unforeseen impact. For example, when designing an application or website, there are several well-known UI (user interface) design principles, including clarity, consistency, simplicity, user control, usability, accessibility, and delight. AI may help to develop an application or website, but it is challenging to develop one that satisfies all these principles, because some may conflict and require a subtle balance. For instance, a user interface with information density and overload to nurture the users' feeling of control would harm the value of simplicity. As such, a

human designer's intervention based on value judgement can make sense of the complexities and uncertainty based on a thorough understanding of the design context. Moreover, designers' ingenuity is critical in improving the details of the features, style, feel, and forms as they are created in the process of synthesising different ideas and judging their value. Although AI generates many proposed design options at high speed, these lack finesse or reflection. Because of the human designers' sensitivity, the subtle nuances of design generated by AI can be adjusted.

AI is bringing more complexity into current design practices, notions, and a small fraction of what we are going to be faced with. Whether easy or difficult, the future is coming faster than we think, and AI will be a part of our creative practice. Although this advanced technology is proliferating rapidly and seems to be a threat to designers, this chapter argues that designers cannot be replaced by AI without the human capabilities of empathy, problem-finding and -framing, ingenuity, and value judgement, attributes that will always be utilised over the design process. In the early phase of the design process, finding and framing a design problem based on empathising with users and comprehending the context is critical. Later in the design process, designers making sense of uncertainty and subtle nuances are required to make the appropriate design decision and improve the user experience. AI is an intelligent tool that designers can exploit rather than combat. It is a stepping stone to something more useful, meaning we designers need to think about how we will use it. That is the challenge, but we shall bring design ingenuity to how we utilise this tool, shaping a new generation in this way of creating innovation rather than being threatened by it.

### Reference list

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